



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/650,729	08/29/2003	Chung-Peng Ho	241330US6YA	7660

22850 7590 05/02/2005

OBLON, SPIVAK, MCCLELLAND, MAIER & NEUSTADT, P.C.
1940 DUKE STREET
ALEXANDRIA, VA 22314

EXAMINER

CHACKO DAVIS, DABORAH

ART UNIT	PAPER NUMBER
----------	--------------

1756

DATE MAILED: 05/02/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/650,729	HO ET AL.	
	Examiner	Art Unit	
	Daborah Chacko-Davis	1756	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 14 February 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-34 is/are pending in the application.
- 4a) Of the above claim(s) 33 and 34 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1, 7-12, 18-26 and 32 is/are rejected.
- 7) ☒ Claim(s) 2-6, 13-17 and 27-31 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

1. Applicant's election with traverse of Group I, claims 1-32, in the reply filed on February 14, 2005, is acknowledged. The traversal is on the ground(s) that the claims appear to be part of an overlapping search area and that the entire application does not place a serious burden on the Examiner. This is not found persuasive because the non-elected claims (Group II, claims 33-34) are directed to a product, and the product claimed can be made by a materially different process such as a PVD process.

The requirement is still deemed proper and is therefore made FINAL.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 1, 8-10, 12, and 18, are rejected under 35 U.S.C. 102(e) as being anticipated by U. S. Patent Application Publication No. 2005/0036184 (Yeo et al).

Yeo , in the abstract, in [0035], [0036], [0038], [0039], and [0054], discloses a method of forming patterns in a photosensitive layer on a substrate comprising exposing the photosensitive material layer to an optical energy source in an immersion

Art Unit: 1756

lithography system, and thermally treating the substrate to remove the excess fluid on the layer (claims 1, 10). Yeo, in [0051], [0052], [0053], and [0054], discloses that performing thermal treatment reduces the swelling associated with the immersion illumination and thereby increases the uniformity of the features formed (claims 8, 12). Yeo, in [0041], discloses that the photoresist employed for exposure is either a 157nm photoresist or a 193nm photoresist (claims 9, 18).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 7, 11, 19, 20, 21, 22, 23, 24, 25, 26, and 32, are rejected under 35 U.S.C. 103(a) as being unpatentable over by U. S. Patent Application Publication No. 2005/0036184 (Yeo et al) in view of U. S. Patent Application Publication No. 2005/0007567 (Pierrat et al).

Yeo, in [0036], [0038], and [0041], discloses forming a photoresist layer on the substrate, and performing exposure on the photoresist layer coated substrate positioned in the immersion fluid lithographic system, and developing the exposed film using a developer solution (claims 19, 20, and 22). Yeo, in the abstract, in [0035], [0036], [0037], [0038], [0039], and [0054], discloses forming patterns in a photosensitive layer on a substrate comprising exposing the photosensitive material layer to an optical

Art Unit: 1756

energy source in an immersion lithography system, and subsequent to exposure, performing a thermal treatment on the substrate to remove the excess perfluoropolyether fluid on the exposed resist layer (claims 21, 24, and 26). Yeo, in [0035], discloses that the immersion lithographic system includes an optical energy source (radiation source), an imaging module (imaging system), and a substrate holder (stage) (claim 23). Yeo, in [0041], discloses that the photoresist employed for exposure is either a 157nm photoresist or a 193nm photoresist (claim 32).

The difference between the claims and Yeo is that Yeo does not disclose baking the exposed resist film following the drying process (claims 7, and 11). Yeo does not disclose that the photoresist-coated substrate is baked to cure the thin film. Yeo does not disclose a track system coupled to the immersion lithography system, wherein the track system includes at least one of the units recited in claim 25.

Pierrat, in [0060], discloses that the resist is baked prior to exposure (prebaked to cured the coated film), and is post exposure bake for a period of time (baking after exposure, and drying). Pierrat, in [0060], and [0077], discloses that the resist includes a photoacid generator, and that upon irradiation (during exposure) generates acid that de-protect chemical functions (the post-exposure baking is performed after drying, resulting in acid diffusion in the resist). Pierrat, in [0080], [0081], and [0083], discloses that a cleaning unit, and drying unit is coupled to the immersion lithography system (through a track system or a conveyor).

Therefore, it would be obvious to a skilled artisan to modify Yeo by pre-baking the coated resist film, and post-exposure baking (causing acid diffusion in the resist) the

Art Unit: 1756

exposed resist film as taught by Pierrat, because Pierrat, in [0060], discloses that prebaking and post-exposure baking conditions determines the location (best location) at which the image is formed in the resist. It would be obvious to a skilled artisan to modify Yeo by employing the track system (conveyor system) taught by Pierrat, because Pierrat, in [0080], [0082], discloses that positioning the cleaning or drying system in close proximity to the wafer stage minimizes throughput losses, and enables the processes to be performed on the wafer in a plasma environment (a controlled environment).

Allowable Subject Matter

6. Claims 2-6, 13-17, and 27-31, are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Daborah Chacko-Davis whose telephone number is (571) 272-1380. The examiner can normally be reached on M-F 9:30 - 6:00. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark F Huff can be reached on (571) 272-1385. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306. Information regarding the status of an application may be obtained from the Patent

Art Unit: 1756

Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

dcd
WD

April 22, 2005.



JOHN A. MCPHERSON
PRIMARY EXAMINER